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Response to Office Action Mailed March 16, 2010

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in this application.

1. (Currently Amended) A method for generating a carrier residual signal, comprising the steps of:

causing a light wave having a specific wavelength to enter into an optical modulating unit comprising an SSB optical modulator; formed on a substrate and a bypass optical waveguide that is formed on the same substrate and that connects an input part of the SSB optical modulator to an output part of the SSB optical modulator;

providing a carrier component related to a zero-order Bessel function in the bypass optical waveguide;

providing a specific signal component related to a specific high-order Bessel function while suppressing signal components other than the specific signal component related to the specific high-order Bessel function in the SSB optical modulator;

causing to be included in a light wave emitted from the optical modulating unit ~~a the carrier component related to a zero-order Bessel function and a the specific signal component related to a specific high-order Bessel function while suppressing signal components other than the specific signal component related to the specific high-order Bessel function;~~ and

setting a ratio of optical intensity between the carrier component and the specific signal component substantially to 1.

2. (Previously Presented) The method for generating a carrier residual signal according to claim 1,

wherein the SSB optical modulator comprises two sub-Mach-Zehnder type optical waveguides nested into branch waveguides of a main Mach-Zehnder type optical waveguide.

3. (Previously Presented) The method for generating a carrier residual signal according to claim 2, further comprising the step of:

adjusting an optical modulation phase or intensity in the two sub-Mach-Zehnder type optical waveguides or the main Mach-Zehnder type optical waveguide.

4. (Cancelled).

5. (Currently Amended) A device for generating a carrier residual signal comprising:

an optical modulating unit that comprises a light source generating a light wave having a specific wavelength, and an optical modulating unit comprising an SSB optical modulator formed on a substrate, wherein

the optical modulating unit comprises a bypass optical waveguide that is formed on the same substrate as the SSB optical modulator, and that connects an input part of the SSB optical modulator to an output part of the SSB optical modulator,

a light wave emitted from the light source enters into the optical modulating unit,
the bypass optical waveguide provides a carrier component related to a zero-order Bessel function,

the SSB optical modulator provides a specific signal component related to a specific high-order Bessel function while suppressing signal components other than the specific signal component related to the specific high-order Bessel function.

a light wave emitted from the optical modulating unit comprises ~~a the~~ carrier component related to ~~a zero order Bessel function~~ and ~~a the~~ specific signal component related to ~~a specific high order Bessel function while suppressing signal components other than the specific signal component related to the specific high order Bessel function~~, and

a ratio of optical intensity between the carrier component and the specific signal component is set substantially to 1.

6. (Previously Presented) The device for generating a carrier residual signal according to claim 5,

wherein the SSB optical modulator comprises two sub-Mach-Zehnder type optical waveguides nested into branch waveguides of a main Mach-Zehnder type optical waveguide.

7. (Previously Presented) The device for generating a carrier residual signal according to claim 6,

further comprising a film formed on the two sub-Mach-Zehnder type optical waveguides or the main Mach-Zehnder type optical waveguide.

8. (Previously Presented) The device for generating a carrier residual signal according to claim 6,

wherein the two sub-Mach-Zehnder type optical waveguides or the main Mach-Zehnder type optical waveguide comprise a portion having a structure in which two branch waveguides in each Mach-Zehnder type optical waveguide are arranged asymmetrically to electrodes for applying a modulation electric field or a direct current bias electric field to the branch waveguides.

9. (Previously Presented) The device for generating a carrier residual signal according to claim 6,

wherein the two sub-Mach-Zehnder type optical waveguides or the main Mach-Zehnder type optical waveguide comprise

electrodes for applying a modulation electric field or a direct current bias electric field to two branch waveguides in each Mach-Zehnder type optical waveguide, and

adjusting electrodes for adjusting the electric field applied to the branch waveguides.

10-11. (Cancelled).

12. (Currently Amended) The device for generating a carrier residual signal according to ~~claim 10~~, claim 5,

wherein an optical intensity adjusting unit, which adjusts intensity of a light wave propagating through the bypass optical waveguide, is disposed in a middle of the bypass optical waveguide.

13. (Cancelled).

14. (Currently Amended) The device for generating a carrier residual signal according to claim 7, wherein a portion of the film on the two sub-Mach-Zehnder type optical waveguides or the main Mach-Zehnder type optical waveguide is removed.

15-20. (Cancelled).